

CLAIMS**What Is Claimed Is:**

1. An apparatus, comprising:
5 an optical source for providing an optical signal into a slurry;
an optical sensor for detecting said optical signal; and
a controller to determine whether a physical characteristic of said slurry is within a
predetermined tolerance level in an online manner, in response said optical
signal.
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2. The apparatus of claim 1, wherein said controller comprises an optical sensor
interface to receive said optical signal.
3. The apparatus of claim 1, wherein said optical signal is capable of being
15 modified as a function of an amount of solid in said slurry.
4. The apparatus of claim 3, wherein said controller is capable of determining an
amount of solid in said slurry based upon said modified optical signal.
- 20 5. The apparatus of claim 1, wherein said controller is adapted to compare said
optical signal to a predetermined tolerance level stored in a library to determine whether said
physical characteristic of said slurry is within a predetermined tolerance level.
6. The apparatus of claim 1, further comprising a feedback unit, said feedback
25 unit to provide data relating to a feedback adjustment of said slurry based upon a
determination that said physical characteristic of said slurry is not within said predetermined
tolerance level.
7. The apparatus of claim 1, further comprising a pressure sensor, said pressure
30 sensor to determine an amount of pressure experienced by said slurry.

8. The apparatus of claim 7, further comprising a flow sensor, said flow sensor to determine a flow rate relating to the flow of said slurry.

9. The apparatus of claim 8, wherein said controller is adapted to correlate a percentage of solid in said slurry with at least one of said pressure experienced by said slurry and said flow rate.

10. The apparatus of claim 9, wherein said controller is adapted to provide a feedback signal to modify said percentage of solid in said slurry based upon said correlation.

11. The apparatus of claim 10, wherein said feedback signal comprises at least one of a signal to modify the pressure experienced by said slurry, a signal to modify said flow rate, and a signal to provide a liquid compound into said slurry.

12. The apparatus of claim 10, further comprising a pump for adjusting the pressure experienced by said slurry.

13. The apparatus of claim 10, further comprising a valve for adjusting the flow rate of said slurry.

14. A system, comprising:

a process chemical unit to provide a slurry;

a processing tool to perform a process upon a semiconductor wafer using said slurry;

a slurry transport conduit to transport said slurry from said process chemical unit to

said processing tool, said slurry transport conduit comprising an optical source for providing an optical signal into said slurry and an optical sensor for detecting said optical signal; and

a slurry analysis unit to perform an online analysis of said slurry in said slurry

transport conduit, said slurry analysis unit comprising a controller to

determine whether a physical characteristic of said slurry is within a

predetermined tolerance level in an online manner, in response to said optical signal.

15. The system of claim 14, wherein said processing tool is adapted to perform a chemical-mechanical planarization process upon said semiconductor wafer.

5 16. The system of claim 14, wherein said slurry analysis unit further comprises an optical sensor interface to receive said optical signal.

10 17. The system of claim 14, wherein said optical signal is capable of being modified as a function of an amount of solid in said slurry.

18. The system of claim 17, wherein said slurry analysis unit is capable of determining an amount of solid in said slurry based upon said modified optical signal.

15 19. The system of claim 18, wherein said slurry analysis unit is adapted to compare said optical signal to a predetermined tolerance level stored in a library to determine whether said physical characteristic of said slurry is within a predetermined tolerance level.

20 20. The system of claim 14, wherein said slurry analysis unit further comprising a feedback unit, said feedback unit to provide data relating to feedback adjustment of said slurry based upon a determination that said physical characteristic of said slurry is not within said predetermined tolerance level.

25 21. The system of claim 14, wherein said slurry transport conduit further comprising a pressure sensor, said pressure sensor to determine an amount of pressure experienced by said slurry.

30 22. The system of claim 21, wherein said slurry transport conduit further comprising a flow sensor, said flow sensor to determine a flow rate relating to the flow of said slurry.

23. The system of claim 22, wherein said slurry analysis unit further comprises a sensor data analysis unit, said sensor data analysis unit being adapted to correlate a

percentage of solid in said slurry with at least one of said pressure experienced by said slurry and said flow rate.

24. The system of claim 14, wherein said slurry analysis unit further comprises a
5 feedback unit, wherein said feedback unit is adapted to provide a feedback signal to modify said percentage of solid in said slurry based upon said correlation.

25. The system of claim 24, wherein said feedback signal comprises at least one of
a signal to modify the pressure experienced by said slurry, a signal to modify said flow rate,
10 and a signal to provide a liquid compound into said slurry.

26. The system of claim 14, wherein said slurry transport conduit further
comprising a pump for adjusting the pressure experienced by said slurry.

27. The system of claim 26, wherein said slurry transport conduit further
15 comprising a valve for adjusting the flow rate of said slurry.

28. The system of claim 26, further comprising a flow control unit operatively
coupled to said slurry analysis unit, said flow control unit being adapted to control at least
20 one of said flow rate and said pressure experienced by said slurry.

29. A method, comprising:
receiving a request to provide a slurry to a processing tool;
transporting said slurry through a slurry transport unit to said processing tool based
25 upon said request; and
performing an online monitoring of a physical characteristic of said slurry, said online
monitoring comprising analyzing an optical signal sent through said slurry to
determine whether said physical characteristic of said slurry is within a
predetermined level of tolerance.

30. The method of claim 29, wherein performing said online monitoring of said physical characteristic of said slurry further comprises determining a percentage of solid in said slurry based upon said optical signal.

5 31. The method of claim 29, wherein performing an online monitoring of a physical characteristic of said slurry further comprises determining a pressure experienced by said slurry in said slurry transport unit.

10 32. The method of claim 31, wherein performing an online monitoring of a physical characteristic of said slurry further comprises determining a flow rate of said slurry in said slurry transport unit.

15 33. The method of claim 32, wherein performing an online monitoring of a physical characteristic of said slurry further comprises correlating said percentage of solid in said slurry to at least one of said pressure experienced by said slurry and said flow rate of said slurry.

20 34. The method of claim 33, wherein performing an online monitoring of a physical characteristic of said slurry further comprises determining a feedback signal to adjust one of said pressure, said flow-rate, and an injection of a fluid into said slurry in response to a determination that said percentage of solid within said slurry is not within said predetermined tolerance.

25 35. A computer readable program storage device encoded with instructions that, when executed by a computer, performs a method, comprising:
receiving a request to provide a slurry to a processing tool;
transporting said slurry through a slurry transport unit, based upon said request; and
performing an online monitoring of a physical characteristic of said slurry, said online
monitoring comprising analyzing an optical signal sent through said slurry to
30 determine whether said physical characteristic of said slurry is within a
predetermined level of tolerance.

36. The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method of claim 35, wherein performing said online monitoring of said physical characteristic of said slurry further comprises determining a percentage of solid in said slurry based upon said optical signal.

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37. The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method of claim 35, wherein performing an online monitoring of said physical characteristic of said slurry further comprises determining a pressure experienced by said slurry in said slurry transport unit.

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38. The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method of claim 37, wherein performing an online monitoring of said physical characteristic of said slurry further comprises determining a flow rate of said slurry in said slurry transport unit.

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39. The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method of claim 38, wherein performing an online monitoring of said physical characteristic of said slurry further comprises correlating said percentage of solid in said slurry to at least one of said pressure experienced by said slurry and said flow rate of said slurry.

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40. The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method of claim 39, wherein performing an online monitoring of said physical characteristic of said slurry further comprises determining a feedback signal to adjust one of said pressure, said flow-rate, and an injection of a fluid into said slurry in response to a determination that said percentage of solid within said slurry is not within said predetermined tolerance.

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